

Week 5 Recitation Problems

MATH:113, Recitations 304 and 305

Names: _____



1. Plot the function $f(x) = x^2$. Next, find and plot the secant lines for $a = 2$ and: $b = 1$, $b = 3/2$, and $b = 5/2$.

2. Which line best approximates the slope of $f(x)$ at $x = 2$?

3. Write down the limit definition for the derivative of a function $f(x)$: explain what each variable represents.

Definition 1: derivative of a function.

4. Why does the above expression give us the *exact* slope?

5. Are there any scenarios where a function *doesn't* have a derivative? If so, give an example.

6. Find the derivatives of the functions below. After finding each derivative, find the value of the derivative at the input value $x = 4$.

$$f(x) = \sqrt{5x - 8}$$

$$h(x) = \frac{1}{x}$$

$$g(x) = 7x^2 + 5x$$

$$L(x) = \frac{x}{x+1}$$